

CELL PHONE RETRACTABLE EARPIECE

BACKGROUND OF THE INVENTION

This invention relates to earpieces for cellular phones and more particularly to a cell-phone retractable earpiece on a phone wire that is spring-wound into and out from a line pocket that is built into or attachable to a cellular phone

Holding cell phones while using them has become a well-known hazard. A wide selection of hands-free cell-phone systems have been devised as remedies but not with the convenience, effectiveness and reliability of a spring-coiled phone wire to an ear-hooked earpiece in a manner taught by this invention.

Examples of most-closely related known but different devices are described in the following patent documents:

<u>Patent No.</u>	<u>Inventor</u>	<u>Issue Date</u>
5,613,222	Guenther	03/18/1997
5,422,957	Cummins	06/06/1995
4,942,617	Boylan	07/17/1990
4,864,610	Stevens	09/05/1989
4,754,484	Larkin, <i>et al.</i>	06/28/1988
4,420,657	Larkin	12/13/1983

Referring to the above patent documents, Guenther described a different type of head set in communication with a cellular phone with a flexible acoustical tube instead of with a spring-coiled wire as taught by this invention. Cummins described a cable take-up for connecting headphones to an entertainment device having a hollow case, a spindle for a flat cable, an electrical plug and other limiting features different from a smaller and more compact retractable earpiece taught by Applicant. Boylan described an earphone cord take-up device with a hollow casing worn on a

belt instead of being built into or attachable to a cellular phone on an end of a phone wire that is retractable into a cell-phone pocket on a cellular phone. Stevens described a conical ear cushion on a tip of a flexible sound tube in communication with a user's inner ear. Larkin, *et al.* taught a miniature handset that is convertible
5 into a headset for use in conjunction with a telephone base set. Larkin described an adjustable headset having a microphone on a boom in addition to the cylindrical cushion described by Larkin, *et al.*

SUMMARY OF THE INVENTION

10 Objects of patentable novelty and utility taught by this invention are to provide a cell-phone retractable earpiece which:

attaches an earpiece stably, effectively, comfortably and conveniently to a user's ear for hands-free use of a cell phone that is positioned wherever desired on the user;

15 has an automatically retractable phone line from the cell phone to the ear piece;

avoids entanglement of cell-phone line;

takes minimal space on a cell phone; and

can be built onto or attached to a cell phone.

20 This invention accomplishes these and other objectives with a cell-phone retractable earpiece having a phone-wire reel in a reel pocket on a cell phone that is attachable to a user. The phone-wire reel is wind-tensioned to wind the phone wire onto the phone-wire reel in opposition to pulling the phone wire and locking the reel in a desired unwound mode. The earpiece is attached to a user's ear with an ear

hook having a sound reproducer with a sound conveyor into a user's ear. A retractable microphone is extendible from the phone wire to a position proximate a user's mouth. An optional ear clamp can be employed for firm attachment of the earpiece to the user's ear.

5 The above and other objects, features and advantages of the present invention should become even more readily apparent to those skilled in the art upon a reading of the following detailed description in conjunction with the drawings wherein there is shown and described illustrative embodiments of the invention.

BRIEF DESCRIPTION OF DRAWINGS

10 This invention is described by appended claims in relation to description of a preferred embodiment with reference to the following drawings which are explained briefly as follows:

15 **FIG. 1** is a partially cutaway side view of the cell-phone retractable earpiece on a dashed-line representation of a cell-phone user's ear;

FIG. 2 is a side view of a reel pocket on a cell phone;

FIG. 3 is a front view of the **FIG. 1** illustration;

FIG. 4 is an exploded front view of a sound reproducer with a miniature conical horn as a sound magnifier on and adjustable-size ear hook;

20 **FIG. 5** is the **FIG. 4** illustration with tubular communication to an inside portion of an ear;

FIG. 6 is a head-top view showing an optional ear clamp;

FIG. 7 is a side view of an ear portion of the **FIG. 6** illustration; and

FIG. 8 is a partially cutaway and exploded side view of a phone-wire reel having a mechanical spring motor for winding tension.

DESCRIPTION OF PREFERRED EMBODIMENT

Listed numerically below with reference to the drawings are terms used to describe features of this invention. These terms and numbers assigned to them designate the same features throughout this description.

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|-----------------------|---------------------------|
| 1. Phone-wire reel | 16. Microphone |
| 2. Reel pocket | 17. Microphone extension |
| 3. Cell phone | 18. User's mouth |
| 4. Head | 19. Conical horn |
| 5. Phone wire | 20. Tubular member |
| 6. Reel axle | 21. Ear clamp |
| 7. Ear hook | 22. First clamp jaw |
| 8. Ear rest | 23. Second clamp jaw |
| 9. User's ear | 24. Ear-grasp member |
| 10. Ear-aft curvature | 25. Clamp connector |
| 11. Hook bottom | 26. Retractable appendage |
| 12. Ear-size adjuster | 27. Electrical motor |
| 13. Ear cavity | 28. Mechanical spring |
| 14. Sound reproducer | 29. Phone-wire clamp |
| 15. Sound conveyor | 30. Un-locker |

Referring first to **FIGS. 1-3**, a phone-wire reel **1** is wind-tensioned in a reel pocket **2** on a cell phone **3** that is attachable to a cell-phone user represented by a dashed-line head **4** of the cell-phone user. Phone wire **5** is in phone-electrical sound communication with the cell phone **3** proximate a reel end of the phone wire **5** that is attached to a reel axle **6** onto which the phone wire **5** is windable. The reel axle **6** is wind-tensioned to wind the phone wire **5** onto the phone-wire reel **1** in

predetermined opposition to pulling the phone wire **5** and locking the reel axle **6** in a selectively unwound mode.

An ear hook **7** containing an ear-hook portion of the phone wire **5** has an ear rest **8** on a top of a user's ear **9**, an ear-aft curvature **10** and a hook bottom **11** proximate a bottom of the user's ear **9**. An ear-size adjuster **12** containing an adjuster portion of the phone wire **5** has adjustability of length of the ear-size adjuster **12** intermediate the top of the user's ear **9** and an ear cavity **13** of the user's ear **9**.

A sound reproducer **14** on a bottom of the ear-size adjuster **12** proximate the ear cavity **13** has a sound conveyor **15** in sound communication intermediate the sound reproducer **14** and a predetermined position in the ear cavity **13**.

A microphone **16** on a microphone extension **17** is in phone-sound communication with the phone wire **5** proximate a user's mouth **18**.

Referring to **FIGS. 1 and 3-5**, the sound reproducer **14** can include a conical horn **19** as shown in **FIG. 4** or a tubular member **20** as shown in **FIG. 5** to convey sound from the sound reproducer **14** towards an inner portion of the user's ear **9**. The conical horn **19** can circle an entrance and the tubular member **20** can enter the inner portion of the user's ear **9**.

Referring to **FIGS. 6-7**, the ear hook **7** can include an ear clamp **21** having a first clamp jaw **22** attached to the ear hook **7** and a second clamp jaw **23** with an ear-grasp member **24** attached to the sound reproducer **14**. The ear clamp **21** can be a resilient member that is positioned over a top of the user's ear **9** as shown in **FIG. 6** or at desired positions intermediate a back of the user's ear **9** as shown in **FIG. 7** and the top of the user's ear **9**. Preferably, the ear-grasp member **24** is

broadly cushioned and the ear hook 7 also is broadly cushioned for long-lasting comfort of grasping of the user's ear 9 as shown cross hatched in FIG. 6 between the ear rest 8 and the ear-grasp member 24. Positioning of the ear clamp 21 approximately in line horizontally with the sound reproducer 14 and the ear cavity 13 as shown in FIG. 7 is preferable to ear-top positioning shown in FIG. 6 because the ear cavity 13 is close to the back of the user's ear 9, a clamp connector 25 can be shorter and ear-grasping is most effective.

Referring to FIGS. 1, 3 and 6-7, the microphone extension 17 can be extended firmly from proximate the sound reproducer 14 as shown in FIGS. 6-7 when the ear clamp 21 is used, but can be extended from any desired position along the ear hook 7 or the phone wire 5. Optionally, the microphone 16 can be positioned on a retractable appendage 26 that can be extended from the ear hook 7 as shown in FIG. 3 or from the phone wire 5.

The reel axle 6 can be wind-tensioned with an electrical motor 27 as shown in FIG. 1 or with a mechanical spring 28 that is represented by a clock spring illustrated in FIG. 8.

As shown in FIGS. 1 and 8, the phone-wire reel 1 is locked in the selectively unwound mode with a winding lock that can be a phone-wire clamp 29 that can include an un-locker 30 having unlock communication to the winding lock. The unlock communication can include a double jerk of the phone wire 5 or a predetermined touching of the reel pocket 2 for activating travel of the un-locker 30 in a direction of separation from the phone-wire clamp 29.

The phone wire 5 has a length of preferably about three feet and can be standard phone wire that is used commonly intermediate a phone jack and a

telephone handset. Optionally, the phone wire 5 can be customized phone wire having an insulated outside perimeter that is circumferential with a diameter of approximately two millimeters and contains all standard phone-wire lines with predeterminedly thin insulation. The reel pocket 2 has a thickness of preferably about one-quarter inch, a width not greater than a width of the cell phone 3 and a length not greater than a length of the cell phone 3.

A new and useful cell-phone retractable earpiece having been described, all such foreseeable modifications, adaptations, substitutions of equivalents, mathematical possibilities of combinations of parts, pluralities of parts, applications and forms thereof as described by the following claims and not precluded by prior art are included in this invention.